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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/635,810	08/05/2003	Jonathan Simon	10021278-1	8835

7590 02/22/2005

AGILENT TECHNOLOGIES, INC.
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EXAMINER	
DUPUIS, DEREK L	
ART UNIT	**PAPER NUMBER**
2883	

DATE MAILED: 02/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

H·A

Office Action Summary	Application No.	Applicant(s)	
	10/635,810	SIMON ET AL.	
	Examiner	Art Unit	
	Derek L Dupuis	2883	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *amendment filed 1/24/2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4,6-14,16-20,22 and 23* is/are pending in the application.

4a) Of the above claim(s) 5,15,21 is/are withdrawn from consideration.

5)☒ Claim(s) *22 and 23* is/are allowed.

6)☒ Claim(s) *1-3,6-13 and 16-20* is/are rejected.

7)☒ Claim(s) *4 and 14* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *05 August 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ ~~Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)~~ Paper No(s)/Mail Date _____.
4) ☒ Interview Summary (PTO-413) Paper No(s)/Mail Date. *2/10/2005*.
5) ☐ ~~Notice of Informal Patent Application (PTO-152)~~
6) ☐ Other: _____.

Brian Healy
Primary Examiner

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-3, 6-8, 10-13, and 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over ***Wang et al. (US 6,307,987 B1)*** in view of ***Kragl (US 6,832,861 B2)***.

3. With regard to claim 1, Wang et al teach an optical interconnect for a fiber optic system in figure 7 of the prior art reference. The interconnect includes optoelectronic devices (62 and 92) such as an LED or an optical pickup (see column 6, lines 29-67 of Wang). The interconnect also has a penetrator (38) made of an optically transmissive material. Wang et al specify that the notch (34) can be filled by an optically transmissive and luminescent filling material (see column 3, line 39 column 4, line 2). The solid filling inside of the notch constitutes the penetrator. The penetrator is optically coupled to the optoelectronic device as seen by the vertical arrows in the figure. The penetrator is configured for insertion along the length of the optical fiber (32) so as to transfer light between the optical fiber to the optoelectronic devices (62 and 92). Wang et al do not teach that the optoelectronic devices are VCSELs. Kragl teaches that VCSELs are obvious design choices over LED's (see figure 8 and column 15, lines 10-35 of Kragl).

4. With regard to claims 2 and 3, Wang et al in view of Kragl teach an optical interconnect for a fiber optic system as discussed above in reference to claim 1. As seen in figures 7 and 13, the penetrator (filled notch) taught by Wang et al can have a pyramidal or a conical shape.

5. With regard to claims 6 and 7, Wang et al in view of Kragl teach an optical interconnect for a fiber optic system as discussed above in reference to claim 1. Wang et al also teach a filter coating (40 in figure 1) that cause reflections of infrared light to pass through the optical fiber and not reflect into the optoelectronic device. Wang et al also teach that the filter coating (40) and luminescent coating (36) help to couple visible light between the optical fiber and the optoelectronic device.

6. With regard to claim 8, Wang et al in view of Kragl teach an optical interconnect for a fiber optic system as discussed above in reference to claim 1. Wang et al also teach that the penetrator pierces an optical fiber to optically couple the optoelectronic device to the optical fiber as shown in figure 7.

7. With regard to claim 10, Wang et al in view of Kragl teach an optical interconnect for a fiber optic system as discussed above in reference to claim 1. Wang et al also teach a plastic optical fiber shown in figure 7 where in the penetrator is inserted along the length of the fiber at least halfway across the diameter as shown in the figure.

8. With regard to claim 11, Wang et al teach a parallel optical interconnect for a fiber optic system as shown in figures 23-26 of Wang et al. Wang et al teach a plurality of optoelectronic devices arranged in a linear array. Wang et al further teach a plurality of filled notches (penetrators) filled with an optically transmissive material that optically couples an optoelectronic device to its corresponding plastic optical fiber. The penetrators are configured for insertion along the length of the optical fiber as shown in figure 7 of Wang et al. Wang et al also teach that the optical fibers of the array are arranged side by side. Wang et al do not teach

that the optoelectronic devices are VCSELs. Kragl teaches that VCSELs are obvious design choices over LED's (see figure 8 and column 15, lines 10-35 of Kragl).

9. With regard to claims 12 and 13, Wang et al in view of Kragl teach a parallel optical interconnect as discussed above in reference to claim 11. Wang et al also teach in figures 7 and 13 that the penetrator (filled notch) can have a pyramidal or a conical shape.

10. With regard to claims 16 and 17, Wang et al in view of Kragl teach a parallel optical interconnect as discussed above in reference to claim 11. Wang et al also teach a filter coating (40 in figure 1) that cause reflections of infrared light to pass through the optical fiber and not reflect into the optoelectronic device. Wang et al also teach that the filter coating (40) and luminescent coating (36) help to couple visible light between the optical fiber and the optoelectronic device.

11. With regard to claim 18, Wang et al in view of Kragl teach a parallel optical interconnect as discussed above in reference to claim 11. Wang et al also teach in figures 23 and 26 a plurality of optical fibers that each correspond to a penetrator that pierces the optical fiber to optically couple each optoelectronic device to its corresponding optical fiber.

12. It would have been obvious to one of ordinary skill in the art at the time of invention to use a top emitting VCSEL as taught by Kragl as the optoelectronic device in the optical interconnect system taught by Wang et al for the purpose of making "beam forming measures superfluous" since Kragl teaches that VCSELs require less beam forming measures than LEDs.

13. Claims 1 and 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over ***Embery (GB 2,168,165 A)*** in view of ***Kragl (US 6,832,861 B2)***.

14. With regard to claim 1, Embrey teaches an optical interconnect for a fiber optic system. Figure 3 of Embrey teaches an optoelectronic device (8) and a penetrator (9) made of an optically transmissive material. The penetrator is optically coupled to the optoelectronic device. The penetrator is configured for insertion along the length of an optical fiber for transferring light between the optical fiber and the optoelectronic device via the penetrator. Embry does not teach that the optoelectronic devices are VCSELs. Kragl teaches that VCSELs are obvious design choices over LED's (see figure 8 and column 15, lines 10-35 of Kragl).

15. With regard to claims 8-10, Embrey in view of Kragl teach an optical interconnect as discussed above in reference to claim 1. Embrey also teaches an optical fiber having the penetrator pierced therein to optically couple the optoelectronic device to the optical fiber as shown in figure 3 of Embrey. Embrey also teaches an encapsulation layer housing (3) that surrounds the optoelectronic device, the penetrator, and the optical fiber. Embrey also teaches a plastic optical fiber and that the penetrator is inserted along the length of the plastic optical fiber (core 1 and cladding 2) at least halfway across the diameter of the fiber as shown in figure 3 of Embrey.

16. It would have been obvious to one of ordinary skill in the art at the time of invention to use a top emitting VCSEL as taught by Kragl as the optoelectronic device in the optical interconnect system taught by Embry for the purpose of making "beam forming measures superfluous" since Kragl teaches that VCSELs require less beam forming measures than other common light emitting devices.

17. Claims 9 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over ***Wang et al. (US 6,307,987 B1)*** in view of ***Kragl (US 6,832,861 B2)*** as applied to above claims 8 and 18 respectively, and further in view of ***Embery (GB 2,168,165 A)***.

18. With regard to claims 9 and 19, Wang et al in view of Kragl teach an optical interconnect and a plural optical interconnect as discussed above in reference to claims 8 and 18 respectively. Wang et al nor Kragl do not teach an encapsulation layer that at least partially surrounds the optoelectronic devices penetrators, and the optical fibers. Embrey teaches an encapsulation layer (3) in figure 3 that surrounds the optoelectronic device, the penetrator, and the optical fiber. It would have been obvious to one of ordinary skill in the art at the time of invention to use the encapsulating layer taught by Embrey on the optical interconnect taught by Wang et al in view of Kragl. Motivation to do this would be to protect the surrounded elements.

19. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over ***Wang et al. (US 6,307,987 B1)*** in view of ***Kragl (US 6,832,861 B2)*** as applied to claim 11 above, and further in view of the applicant's admission of prior art.

20. With regard to claim 20, Wang et al in view of Kragl teach an optical interconnect as discussed above in reference to claim 11. Wang et al and Kragl do not teach that the optoelectronic devices are attached to a support selected form the group consisting of a common ceramic substrate, a common silicon substrate and a common integrated circuit. Figure 1 of the application, identified by the applicant as prior art, shows ceramic substrate (14) upon which several optoelectronic devices (12) are attached. It would have been obvious to one of ordinary skill in the art at the time of invention to attach the optoelectronic devices of the optical interconnect taught by Wang et al in view of Kragl to a ceramic substrate which is admitted as

prior art by the applicant for the purpose of mounting the optoelectronic devices to the silicon support blocks of the interconnect device.

Allowable Subject Matter

21. Claims 22 and 23 are allowed.

22. Claims 4 and 14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

23. The following is a statement of reasons for the indication of allowable subject matter:

24. Claims 4, 14, 22, and 23 are allowable over the prior art of record because the latter, either alone or in combination, does not disclose nor render obvious an optical interconnect or a plural optical interconnect with penetrators that are etched into a substrate of an optoelectronic device in combination with the rest of the claimed limitations.

Conclusion

25. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. ***Kawai et al (US 5,129,032)*** teach an optical fiber with cone shaped penetrators as shown in figures 9-11. However, these penetrators do not transfer light between the optical fiber and an optoelectronic device.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Derek L Dupuis whose telephone number is (571) 272-3101. The examiner can normally be reached on Monday - Friday 8:30am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G. Font can be reached on (571) 272-2415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Derek L. Dupuis
Group Art Unit 2883

Brian Healy
Primary Examiner